



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,405	04/30/2007	Hideo Hada	SHIGA7.048APC	2382

20995 7590 09/11/2008
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

EXAMINER

EOFF, ANCA

ART UNIT	PAPER NUMBER
----------	--------------

1795

NOTIFICATION DATE	DELIVERY MODE
-------------------	---------------

09/11/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcartee@kmob.com
eOAPilot@kmob.com

Office Action Summary	Application No. 10/576,405	Applicant(s) HADA ET AL.	
	Examiner ANCA EOFF	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07/07/2008, 08/27/2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>07/07/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 9-20 are pending in the application. Claims 1-8 are canceled.
2. The foreign priority documents JP 2003-363521 filed on October 23, 2003, JP 2003-410489 filed on December 9, 2003 and JP 2004-057448 filed on March 2, 2004 were received and acknowledged. However, in order to benefit of the earlier filing date, certified English translations are required.

Continued Examination Under 37 CFR 1.114

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 27, 2008 has been entered.

Claim Rejections - 35 USC § 103

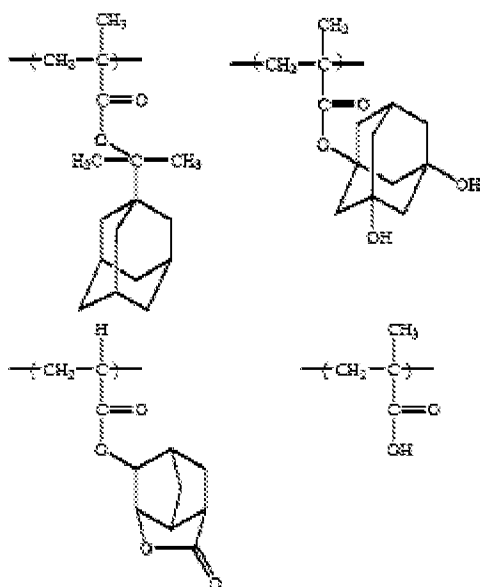
4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 13-18 and 20 are rejected under 35 U.S.C. 103(a) as obvious over Sato (US Pg-Pub 2004/0259028).

With regard to claims 13-16, Sato discloses a positive resist composition comprising resin (A) that increases solubility in a developing solution by the action of an acid and (B) a compound that generates an acid upon irradiation of an actinic ray or radiation (par.0030).

A specific example of resin (A) is given in the formula (I):



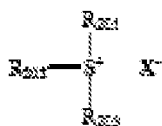
(I) (formula (1) in par.0245), having the weight average molecular weight of 7,800 (table 1 in par.0245).

In the resin (A) above, the first repeating unit is equivalent to the structural unit (a1) derived from a methacrylate ester comprising an acid dissociable, dissolution inhibiting group of claim 14 of the instant application.

The second repeating unit is equivalent to the structural unit (a3) derived from a methacrylate ester comprising a polar group-containing aliphatic hydrocarbon group of claim 16 of the instant application.

The third repeating unit is equivalent to the structural unit (a2) derived from an acrylate ester comprising a lactone-containing polycyclic group of claim 15 of the instant application.

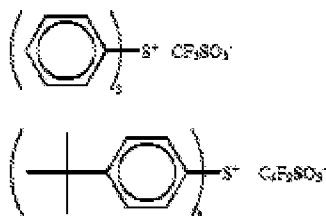
Sato further discloses that the acid generator (B) may be a sulfonium salt of formula (II):



(II) (formula (z1) in par.0143), wherein X^- is a non-nucleophilic anion, such as a bis(alkylsulfonyl)imido anion (par.0148-0149). The alkyl group in the bis (alkylsulfonyl) imido anion is an alkyl group having from 1 to 5 carbon atoms and alkyl groups substituted with a fluorine atoms are preferred (par.0162).

The sulfonium salt of formula (II) above is equivalent to the acid generator (b-2) of the instant application.

The acid generator (B) may also be a sulfonium salt having straight-chain alkyl sulfonate anions, such as:



(formulas (z-1) and (z-2) in par. 0204).

Sato further discloses mixture of sulfonium salts, wherein the salts are used in a weight ration of about 1:3 (Example 8 in table 2, par.0255).

While Sato does not disclose a mixture of a sulfonium salt of formula (II), wherein X^- is a bis(alkylsulfonyl)imido anion and a sulfonium salt having straight-chain alkylsulfonate anions in a ratio of 1:3, it would have been obvious to one of ordinary skill in the art at the time of the invention to use such mixture, based on Sato's teachings regarding the acid generators and the fact that the acid generators may be used in combination (see Examples in table 2, par.0255).

With regard to claim 17, Sato discloses that a nitrogen-containing organic basic compound may be added to the positive resist composition (par.0221).

With regard to claim 18 and 20, Sato discloses a process of forming a pattern, said process comprising the steps of applying the positive resist composition on a substrate, exposing to light through a mask, subjecting to baking and development to obtain a resist pattern (par.0237).

6. Claims 9-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato (US Pg-Pub 2003/0108809) in view of Hatakeyama et al. (US Pg-Pub 2002/0207201).

With regard to claim 9, Sato discloses positive resist composition comprising (A) a resin which increase a solubility rate in an alkali solubility solution by the action of an acid, said resin (A) comprising units (I), (II) and (III) (par.0016).

Preferred units (I) are shown in par.0043 and they are equivalent to the structural unit (a1) derived from a (meth)acrylate containing an acid dissociable, dissolution inhibiting group of the instant application.

Preferred units (III) are shown in par.0052 and they are equivalent to the structural unit (a3) derived from a (meth)acrylate ester comprising a hydroxyl-group containing aliphatic hydrocarbon group of the instant application.

Sato further discloses that the resin (A) preferably contains a repeating unit including an alicyclic lactone structure in order to further decrease the pattern collapsing and pitch dependency (par.0053), wherein the alicyclic lactones include a norbornane lactone or adamantane lactone (par.0054). Examples of such units are shown in par.0074 are they include units which are equivalent to the structural unit (a2) derived from a (meth)acrylate ester comprising lactone-containing polycyclic groups of the instant application.

Specific examples of resin (A) comprising units equivalent to the units (a1), (a2) and (a3) of the instant application are resin (1), resin (2) and resin (4) in par.0177.

Sato further discloses that the molecular weight of the resin (A) is preferably from 3,000 to 100,000 (par.0113), which encompasses the range of the instant application.

While Sato does not specifically disclose a resin (A) comprising units equivalent to the units (a1), (a2) and (a3) of the instant application and having a weight average molecular weight of 7,500 or less, it would have been obvious to one of ordinary skill in the art at the time of the invention to obtain such resin, based on Sato's teaching

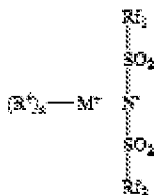
Art Unit: 1795

regarding units (I), (II) and units comprising alicyclic lactone structures (par.0016, 0043, 0052-0054 and 0074) and regarding the molecular weight of resin (A) (par.0113).

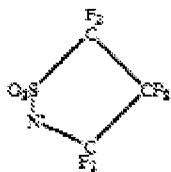
Sato further teaches that the positive resist composition comprises an acid generator or a mixture of acid generators, such as sulfonium salts (par.0118-0119) but fails to specifically disclose the acid generator of the instant application.

Hatakeyama et al. disclose a chemically amplified positive resist material comprising a base resin and an acid generator, wherein the acid generator has high sensitivity and high resolution with respect to high-energy rays of 300 nm or less (abstract). The base resin can be a polymer comprising units derived from (meth)acrylate ester comprising acid-dissociable groups and units derived from (meth)acrylate ester comprising lactone groups (see polymers 1-4 in par.0165).

The acid generator can be a compound represented by the formula (III):

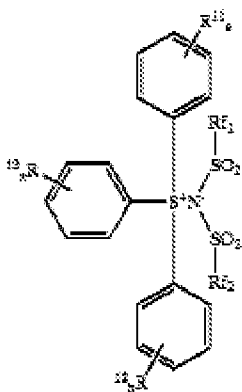


(III) (par.0022), wherein M^+ represents iodonium or sulfonium and R_{f1} , R_{f2} are straight-chained, branched or cyclic alkyl groups having 1 to 20 carbon atoms comprising at least one fluorine atom. R_{f1} and R_{f2} may be bonded together to form a ring (par.0024), as shown in the anion below:



(IV) (formula (1)-26 in par.0025).

Hatakeyama et al. further disclose that the acid generator may be represented by the formula (V):



(V) (par.0030), wherein R¹¹, R¹² and R¹³ may be hydrogen atoms or alkyl groups with 1 to 20 carbons (par.0031).

While Hatakeyama et al. does not specifically disclose sulfonium salts having a triarylsulfonium cation and an anion of formula (IV), it would have been obvious to one of ordinary skill in the art at the time of the invention to obtain such sulfonium salts, based on Hatakeyama's teachings that the onium salts may have an anion of formula (IV) (par.0025) and a triaryl sulfonium cation, such as the one in formula (V) (par.0028-0030).

A triarylsulfonium salt having the anion of formula (II) is equivalent to the compound (b-1) of the instant application.

The resist materials of Hatakeyama et al. have good sensitivity, resolution, line-edge roughness and I/G bias (par.0185).

Since the photoacid generator of Hatakeyama et al. is successfully used for chemically amplified resist comprising resins such as methacrylate copolymers and since Uetani et al. indicate the use of onium acid generators in its composition, it would have been obvious for one of ordinary skill in the art at the time of the invention to use the acid generators of formula (V) as disclosed by Hatakeyama et al. in the chemically amplified positive resist composition of Uetani et al., with a reasonable expectation of success.

With regard to claim 10, Hatakeyama et al. further disclose that an acid generator, different from the one of described above can be added to the composition and indicates a series of compounds comprising as anion a fluoroalkylsulfonate, such as triphenylsulfonium trifluoromethanesulfonate (par.0090).

With regard to claim 11, Sato discloses that the positive resist comprises an organic basic compound (D) (par.0154-0155), equivalent to the nitrogen-containing organic compound of the instant application.

With regard to claims 12 and 19, Sato discloses a process of forming a resist pattern, said process comprising the steps of applying the positive resist composition on a substrate, exposing to light through a desired mask, baking and developing to obtain a pattern (par.0169).

With regard to claims 13-16, Sato discloses positive resist composition comprising (A) a resin which increase a solubility rate in an alkali solubility solution by the action of an acid, said resin (A) comprising units (I), (II) and (III) (par.0016).

Preferred units (I) are shown in par.0043 and they are equivalent to the structural unit (a1) derived from a (meth)acrylate containing an acid dissociable, dissolution inhibiting group of claim 14 of the instant application.

Preferred units (III) are shown in par.0052 and they are equivalent to the structural unit (a3) derived from a (meth)acrylate ester comprising a hydroxyl-group containing aliphatic hydrocarbon group of claim 16 of the instant application.

Sato further discloses that the resin (A) preferably contains a repeating unit including an alicyclic lactone structure in order to further decrease the pattern collapsing and pitch dependency (par.0053), wherein the alicyclic lactones include a norbornane lactone or adamantane lactone (par.0054). Examples of such units are shown in par.0074 are they include units which are equivalent to the structural unit (a2) derived from a (meth)acrylate ester comprising lactone-containing polycyclic groups of claim 15 of the instant application.

Specific examples of resin (A) comprising units equivalent to the units (a1), (a2) and (a3) of the instant application are resin (1), resin (2) and resin (4) in par.0177.

Sato further discloses that the molecular weight of the resin (A) is preferably from 3,000 to 100,000 (par.0113), which encompasses the range of the instant application.

While Sato does not specifically disclose a resin (A) comprising units equivalent to the units (a1), (a2) and (a3) of the instant application and having a weight average

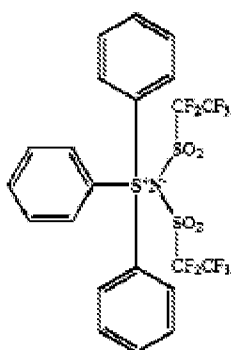
Art Unit: 1795

molecular weight of 8,000 or less, it would have been obvious to one of ordinary skill in the art at the time of the invention to obtain such resin, based on Sato's teaching regarding units (I), (II) and units comprising alicyclic lactone structures (par.0016, par.0043, 0052-0054 and 0074) and regarding the molecular weight of resin (A) (par.0113).

Sato further teaches that the positive resist composition comprises an acid generator or a mixture of acid generators, such as sulfonium salts (par.0118-0119) but fails to specifically disclose the acid generator of the instant application.

Hatakeyama et al. disclose a chemically amplified positive resist material comprising a base resin and an acid generator, wherein the acid generator has high sensitivity and high resolution with respect to high-energy rays of 300 nm or less (abstract). The base resin can be a polymer comprising units derived from (meth)acrylate ester comprising acid-dissociable groups and units derived from (meth)acrylate ester comprising lactone groups (see polymers 1-4 in par.0165).

The acid generator can be a compound represented by the formula (VI):



(VI) (PAG-1 in par.0163), which is equivalent to the compound of formula (b-2) of the instant application wherein R^1 , R^2 , R^3 are phenyl groups and Y, Z are alkyl groups with 2 carbon atoms in which all the hydrogens are replaced with fluorine atoms.

The resist materials of Hatakeyama et al. have good sensitivity, resolution, line-edge roughness and I/G bias (par.0185).

Since the photoacid generator of Hatakeyama et al. is successfully used for chemically amplified resist comprising resins such as methacrylate copolymers and since Uetani et al. indicate the use of onium acid generators in its composition, it would have been obvious for one of ordinary skill in the art at the time of the invention to use the acid generators of formula (IV) as disclosed by Hatakeyama et al. in the chemically amplified positive resist composition of Uetani et al., with a reasonable expectation of success.

Hatakeyama et al. further disclose that an acid generator, different from the one of described above can be added to the composition and indicates a series of compounds comprising as anion a fluoroalkylsulfonate, such as triphenylsulfonium trifluoromethanesulfonate (par.0090).

Sato teaches that sulfonium acid generators may be used in combination, in a weight ratio of 1:4 (see Example 2 in Table 2, par.0180) so it would have been obvious to one of ordinary skill in the art at the time of the invention to use the acid generators of Hatakeyama et al. in a weight ratio of 1:4 for the resist composition of Sato, with a reasonable expectation of success.

With regard to claim 17, Sato discloses that the positive resist comprises an organic basic compound (D) (par.0154-0155), equivalent to the nitrogen-containing organic compound of the instant application.

With regard to claims 18 and 20, Sato discloses a process of forming a resist pattern, said process comprising the steps of applying the positive resist composition on a substrate, exposing to light through a desired mask, baking and developing to obtain a pattern (par.0169).

7. Claims 13-18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uetani et al. (US Pg-Pub 2001/0014428) in view of Hatakeyama et al. (US Pg-Pub 2002/0207201) and in further view of Uetani et al. (US Patent 6,348,297).

With regard to claims 13-16, Uetani et al. disclose a chemically amplified positive resist composition comprising a resin (X) which is insoluble or slightly soluble in alkali but becomes soluble in alkali due to the action of an acid and an acid generating agent (Y) (abstract).

A specific example of resin (X) is a copolymer of 2-methyl-2-adamantyl methacrylate/3,5-dihydroxy-1-adamantyl methacrylate/ α -methacryloyloxy- γ -butyrolactone with Mw=7,100 (par.0098) , wherein;

- the 2-methyl-2-adamantyl unit is equivalent to the structural unit (a1) derived from a methacrylate ester comprising an acid dissociable group;

- the α -methacryloyloxy- γ -butyrolactone unit is equivalent to the structural unit (a2) derived from a methacrylate ester comprising a lactone-containing monocyclic group;

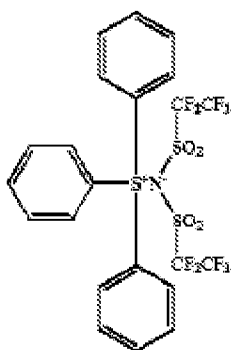
- the 3,5-dihydroxy-1-adamantyl methacrylate unit is equivalent to the structural unit (a3) derived from a methacrylate ester comprising a polar-group containing aliphatic hydrocarbon group.

Uetani et al. further disclose that the acid generator can be an onium compound (par.0030) but fail to include the sulfonium compounds of formula (b-1) or (b-2) of the instant application as sulfonium compounds used as acid generators in the chemically amplified resist composition.

Hatakeyama et al. disclose a chemically amplified positive resist material comprising a base resin and an acid generator, wherein the acid generator has high sensitivity and high resolution with respect to high-energy rays of 300 nm or less (abstract).

The base resin can be a polymer comprising units derived from (meth)acrylate ester comprising acid-dissociable groups and units derived from (meth)acrylate ester comprising lactone groups (see polymers 1-4 in par.0165).

The acid generator can be a compound represented by the formula (VI):



(VI) (PAG-1 in par.0163), which is equivalent to the compound of formula (b-2) of the instant application wherein R^1 , R^2 , R^3 are phenyl groups and Y, Z are alkyl groups with 2 carbon atoms in which all the hydrogens are replaced with fluorine atoms.

The resist materials of Hatakeyama et al. have good sensitivity, resolution, line-edge roughness and I/G bias (par.0185).

Since the photoacid generator of Hatakeyama et al. is successfully used for chemically amplified resist comprising resins such as methacrylate copolymers and since Uetani et al. indicate the use of onium acid generators in its composition, it would have been obvious for one of ordinary skill in the art at the time of the invention to use the acid generators of formula (IV) as disclosed by Hatakeyama et al. in the chemically amplified positive resist composition of Uetani et al., with a reasonable expectation of success.

Hatakeyama et al. further disclose that an acid generator, different from the one of described above can be added to the composition and indicates a series of compounds comprising as anion a fluoroalkylsulfonate, such as triphenylsulfonium trifluoromethanesulfonate (par.0090).

However, Uetani nor Hatakeyama discloses the amount of each acid generator used in combination.

Uetani et al. (US Patent 6,348, 297) disclose a chemical amplification type positive resist composition comprising a combination of acid generators, including a triarylsulfonium salt with a fluoroalkyl sulfonate anion (abstract).

Uetani et al. further disclose compositions comprising a mixture of acid generators, wherein the weigh ratio between the triarylsulfonium salt with a fluoroalkyl sulfonate anion and another onium salt is 1:2. The composition has excellent resolution and good transmittance (Example 5 in table 3, column 22, lines 32-33, wherein B2 and C1 are defined in column 20, lines 30-50)

The composition of Uetani et al. provides a good pattern profile under exposure using light of wavelength of 220 nm or shorter (abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply the teaching of Uetani et al. and use the an onium salt having a fluoroalkylsulfonate anion and the sulfonium salt of formula (VI) in a weight ratio of 1:2 in the composition of Uetani modified by Hatakeyama, with a reasonable expectation of success.

With regard to claim 17, Uetani et al. further disclose that the chemically amplified resist composition comprises a basic nitrogen-containing compound (par.0089).

With regard to claims 18 and 20, Uetani et al. further disclose a method of forming a pattern, comprising the following steps:

- applying the resist solution on a wafer by spin-coating (par.0106)
- pre-baking (par.0106);
- irradiating with an ArF excimer stepper through a line-and-space pattern (par.0107);
- subjecting the exposed wafer to post-exposure baking (par.0107);
- developing with an aqueous tetramethylammonium hydroxide solution, to obtain a developed pattern (par.0107).

Response to Arguments

8. The rejection of claims 9-12 under 35 USC 103(a) over Uetani et al. (US Pg-Pub 2001/0014428) in view of Hatakeyama et al. (US Pg-Pub 2002/0207201) is withdrawn following the applicant's amendment to claim 9.

Applicant's arguments filed on August 27, 2008 with respect to the new amended claims 9-12 have been considered but are moot in view of the new grounds of rejection.

9. Applicant's arguments filed on August 27, 2008 with respect to the rejection of claims 13-18 under 35 USC 103(a) over Uetani et al. (US Pg-Pub 2001/0014428) in view of Hatakeyama et al. (US Pg-Pub 2002/0207201) and in further view of Uetani et al. (US Patent 6,348,297) have been fully considered but they are not persuasive.

On page 9 of the Remarks the applicant argues that Uetani et al. (US Patent 6,348,297) discloses a chemical amplification type photoresist composition comprising an aliphatic sulfonium salt (I), which does not comprise any aromatic groups and an anion salt of formula (IIa) (column 1, line 50-column 2, line 33).

Hatakeyama et al. disclose sulfonium salt with triarylsulfonium cations, which are not equivalent to the sulfonium salt (I) of Uetani et al so the applicant concludes that the combination of acid generators of Hatakeyama et al. is different from the combination of acid generators of Uetani et al.

The examiner did not consider that the acid generators of Uetani et al. and Hatakeyama et al. have equivalent structures but only relied on Uetani et al. to show that using a combination of acid generators is well-known in the art and one of ordinary skill in the art would have the motivation to combine acid generators, with a reasonable expectation of success.

In Examples 3-7 of the specification, the applicant shows that the combination of acid generators (PAG-1) and (PAG-2) give unexpected results.

However, the examiner considers that these Examples 3-7 are not commensurate to the scope of the claims, since claim 9 only claims a composition comprising PAG-1 and claim 13 claims a combination of acid generators, wherein one of the sulfonium salts may be PAG-1, PAG-3 or other sulfonium salt having a bis(alkylsulfonyl) imido anion and the other onium salt may be PAG-2 or any other sulfonium salt having a straight chain fluorinated alkylsulfonate anion.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANCA EOFF whose telephone number is (571)272-

Art Unit: 1795

9810. The examiner can normally be reached on Monday-Friday, 6:30 AM-4:00 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. E./
Examiner, Art Unit 1795

/Cynthia H Kelly/
Supervisory Patent Examiner, Art Unit 1795